

ABSTRACT

An electronic device includes at least a memory core formed of an alloy serving as an electronic conductor and an electrode provided on each of both ends of the memory core. Data is written on the electronic device by supplying an electric current to allow the alloy composition to be biased. The memory core is formed of an alloy which is in a crystallographically stable state before writing or at the time of data recording and in which a non-equilibrium state accompanying with a solid-solid phase transition can be achieved during temperature increase. In this case, the electronic device operates at a very fast speed by utilizing a metastable state and electromigration which takes place at a very fast rate in a non-equilibrium state during a phase transition, thereby ensuring stable writing or re-writing operation. The metastable state includes a state induced by micro-sizing effects, the effects of surface and interface, or the formation of an alloy thin film through simultaneous deposition or the like and also includes a supersaturated state, and an amorphous state.